

APPENDIX 2. LIGHTHOUSES

Archaeologists tell that the earliest lights were wood fires burned on prominent headlands by the cave dwellers in Wales over 3000 years ago. Evidence is the deep deposits of wood ash on these headlands, far too big for food cooking fires.

There is much recorded history of the Mediterranean area of the ancient mariners, the Carthaginians, Phoenicians, Greeks and Romans building wood fired beacons for ship navigation at night. The most famous of these was Sostrates Pharos built ca 285BC on the island of Pharos near Alexandria in Egypt. This was a structure built of white stone on a hill, the light at the top being 512 feet above sea level, and visible under good conditions for 29 miles. This remarkable structure survived for 1,200 years until it was destroyed by earthquake.

In the 13th century when England was beginning to flex its expansionary muscles, the Archbishop of Canterbury created the Trinity Guild. This was quote "to succor those at sea, to feed them when ahungered and athirst, to bind up their wounds, and to build and light proper beacons for the guidance of mariners". He was not altogether altruistic in his intentions for he frequently had his hand well into the money bags. In year 2001, the old archbishop's legacy of Trinity House exists for the purpose of licencing ships' pilots and the operation of lighthouses.

In 1514, King Henry VIII saw some obvious benefits, and created the Corporation of London Pilots. This was the start of 100 years of mayhem. Private operators were licenced to build and operate lighthouses. They paid the Crown for these privileges. Taxes due to the Crown had to be passed down the line so everyone was financially hit. As well, some enterprising but unscrupulous operators began building temporary lights where they should not be, then plundering the unfortunate ships which as a consequence were wrecked. Finally the ship owners, the operators, the merchants and the insurers said "Stop. Enough is enough. We want the government to build and own lighthouses."

So in the early 17th century the British government began to formalise the lighthouse system in the UK. The east coast of Anglia was served by a light at Loestoft in 1609. Dover coast had the Foreland light in 1636. The Nore light ship in the Thames estuary was commissioned in 1734. Dungeness had a light in 1791.

By 1800, almost 200 years after commencement of this formal system, England and Wales had 26 lights, Ireland and Scotland had 10. However, only 66 years later the British Isles had another 500 lights. Why this substantial increase?

The answer lies in two areas. The first was Britain's rapid dominance in world trade. Trade depended upon shipping. Shipping had to be efficient and profitable. Lighthouses were essential for this to occur.

The second was in the light production techniques. Up to this point, lights were fired by big fires burning the best quality whale oil, or the best quality coal, or the best quality English oak. Costly enough with 36 lights but highly expensive with more than 500. A better system was needed. The system which was developed in the early 1800s, and which has continued to today, was to have a small low intensity light, but to magnify this by optical methods. Simultaneously the French and the British proceeded down the same path, but with slightly different approaches. The British used what was termed the Catoptric system, which is light reflection. Today's satellite dishes use exactly the same principle, which is to focus the many light or radio waves into a concentrated beam. The French developed the Dioptric system which is essentially light refraction or bending of the light rays. Eventually the British and the French stopped fighting each other and cooperated in the development of a combined system of light refraction and light reflection in what is known as the Holophotal method.

So the use of expensive whale oil, or coal or oak was discontinued, and replaced by small lamps burning wax candles, or kerosene for the primary light. Later, acetylene was introduced

as the primary fuel, and this remained so until the 1950s when electricity was introduced where possible. Today for those few remaining operational remote lights, solar powered electric cells are in use.

When our ancestor William was a lightkeeper, the small light source and Holophotal lens system was the vogue. His lights would have been powered by candle and/or kerosene. Thus much of his time each day would have been spent cleaning the smoke stains from the many facets of the glass**, and for the bigger lens this task could easily have taken up to 4 hours each day to do the job thoroughly. As well, the rotation mechanism in his day would have been either by wind up clockwork, or by a system of weights, gears and pulleys which due to gravity pulling the weights down would transmit the thrust through the gears to rotate the light. Typically these mechanisms would require manual intervention to reset the operation every 60 minutes throughout the night. So, being a lighthouse keeper meant much regular tedious work.

** The glass lens would typically have something of the order of 500 flat and curved surfaces. Depending upon its location and importance, it would range in diameter from 15 inches to 6 feet, and would stand from 30 inches up to 12 feet high. The lens at Wilsons Promontory for example was 12 feet high, whereas at Port Fairy it was only 40 inches high.